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UTILITY
PATENT APPLICATION
TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	8897-0046-999	Total Pages	72

First Named Inventor or Application Identifier	
Patrick M. Cox	

Express Mail Label No.	EL 236 252 752 US

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:
Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ☒ Fee Transmittal Form
   Submit an original, and a duplicate for fee processing)

2. ☒ Specification   [Total Pages 51]
   (preferred arrangement set forth below)

   -Descriptive title of the Invention
   -Cross Reference to Related Applications
   -Statement Regarding Fed sponsored R&D
   -Reference to Microfiche Appendix
   -Background of the Invention
   -Brief Summary of the Invention
   -Brief Description of the Drawings *(if filed)*
   -Claim(s)
   -Abstract of the Disclosure

3. ☒ Drawing(s) *(35 USC 113) (Formal)*   [Total Sheets 11]

4. ☒ Oath or Declaration   [Total Sheets 3]
   a. ☐ Newly executed (original or copy)
   b. ☒ Copy from a prior application (37 CFR 1.63(d))
      (for continuation/divisional with Box 17 completed)
      [Note Box 5 below]
      i. ☐ DELETION OF INVENTORS(S)
         Signed statement attached deleting inventor(s) named in the
         prior application, see 37 CFR 1.63(d)(2) and 1.33 (b).

5. ☒ Incorporation By Reference *(useable if Box 4b is checked)*

6. ☐ Microfiche Computer Program *(Appendix)*

7. ☐ Nucleotide and/or Amino Acid Sequence Submission
   (if applicable, all necessary)
   a. ☐ Computer Readable Copy
   b. ☐ Paper Copy (identical to computer copy)
   c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. ☐ Assignment Papers (cover sheet & document(s))

9. ☐ 37 CFR 3.73(b) Statement   ☐ Power of Attorney
   (when there is an assignee)

10. ☐ English Translation Document *(if applicable)*

11. ☐ Information Disclosure   ☐ Copies of IDS
    Statement (IDS)/PTO-1449   Citations

12. ☐ Preliminary Amendment

13. ☒ Return Receipt Postcard (MPEP 503)
    (Should be specifically itemized)

14. ☐ Small Entity ☐ Statement filed in prior application,
    Statement(s)   Status still proper and desired

15. ☐ Certified Copy of Priority Document(s)
    (if foreign priority is claimed)

16. ☐ Other: Copy of Certificate Under 37CFR §3.73(b)
    and Revocation and Power of Attorney (3 sheets)

17. If a **CONTINUING APPLICATION**, check appropriate box and supply the requisite information:
    ☒ Continuation   ☐ Divisional   ☐ Continuation-in-part (CIP)   of prior application No: 09/070,521 filed April 29, 1998.

18. CORRESPONDENCE ADDRESS

☒ Customer Number or Bar Code Label

20583
(Insert Customer No. or Attach bar code label here)

or ☐ Correspondence address below

NAME	
ADDRESS	
CITY		STATE		ZIP CODE	
COUNTRY		TELEPHONE		FAX	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Prior application: Examiner S. Wolinsky

                            Art Unit 2742

Assistant Commissioner for Patents
Box PATENT APPLICATION
Washington, D.C. 20231

Sir:

            This is a request for filing a ☒continuation ☐divisional application under 37 CFR § 1.53(b), of pending prior application no. 09/070,521 filed on April 29, 1998.

of Patrick M. Cox *et al.*

                              (inventor(s) currently of record in prior application)

for METHOD AND SYSTEM FOR PERSONALIZED DIRECTORY ASSISTANCE COMMUNICATIONS

                                          (title of invention)

           1.   ☒   The filing fee is calculated below:

PATENT APPLICATION FEE VALUE

TYPE	NO. FILED	LESS	EXTRA	EXTRA RATE	FEE
Total Claims	56	-20	36	$22.00 each	792.00
Independent	11	-3	8	$82.00 each	656.00
			Basic Fee		760.00
			Multiple Dependency Fee If Applicable ($270.00)		
			Total		2,208.00
		50% Reduction for Independent Inventor, Nonprofit Organization or Small Business Concern			-
			Total Filing Fee		$ 2,208.00

          2.   ☒   Please charge the required fee to Pennie & Edmonds LLP Deposit Account No. 16-1150. A copy of this sheet is enclosed.

          3.   ☒   Amend the specification by inserting before the first line the following paragraph: This is a continuation of United States Patent Application Serial No. 09/070,521 filed April 29, 1998, now allowed, which is a division of copending application Serial Number 08/620,374, filed March 22, 1996, issued February 16, 1999 as United States Patent No. 5,873,032, which was a continuation in part of copending Application Serial Number 08/552,222, filed November 2, 1995, issued August 18, 1998 as United States Patent No. 5,797,092, which was a continuation in part of copending Application Number 08/498,900, filed

July 6, 1995, now abandoned, which was a continuation in part of Application Serial Number 08/234,644, filed April 28, 1994, now abandoned. -

4a. ☐ Transfer the drawings from the prior application to this application and abandon the prior application as of the filing date accorded this application. A duplicate copy of this sheet is enclosed for filing in the prior application file.

4b. ☒ New formal drawings are enclosed.

4c. ☐ Informal drawings are enclosed.

5a. ☐ Priority of application no. filed on ΦΦ in ΦΦ is claimed under 35 U.S.C. §119.

5b. ☐ The certified copy has been filed in prior application no. ΦΦ, filed ΦΦ.

6. ☒ The prior application is assigned of record to Metro One Telecommunications, Inc..

7a. ☒ The Power of Attorney appears in the original papers in the prior application no. 09/070,521, filed April 29, 1998.

7b. ☐ Since the Power of Attorney does not appear in the original papers, a copy of the Power in prior application no. ΦΦ, filed ΦΦ is enclosed.

8. ☐ This application contains nucleic acid and/or amino acid sequences required to be disclosed in a Sequence Listing under 37 CFR §§1.821-1.825. It is requested that the Sequence Listing in computer readable form from prior application no. ΦΦ, filed on ΦΦ be made a part of the present application as provided for by 37 C.F.R. §1.821(e). The sequences disclosed therein are the same as the sequences disclosed in this application. A copy of the paper Sequence Listing from application no. ΦΦ is enclosed.

9. ☐ The undersigned states, under 37 C.F.R. §1.821(f), that the content of the enclosed paper Sequence Listing from application no. ΦΦ is the same as the content of the computer readable form submitted in application no. ΦΦ.

10. ☐ A Preliminary Amendment is enclosed.

Respectfully submitted,

_6/7/99_
(date)

Thomas D. Kohl # 32,797
20,280

Harry C. Jones, III   (signature)   (Reg No.)

PENNIE & EDMONDS LLP
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New York, NY 10036
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CA1 - 219011.1

METHOD AND SYSTEM FOR DIRECTORY ASSISTANCE SERVICES

Related Application Data

The present application is a continuation in
part of copending application serial number 08/555,222
filed November 2, 1995, which is a continuation in part
of copending application serial number 08/498,900, filed
July 6, 1995, which is a continuation in part of
copending application serial number 08/234,644, filed
April 28, 1994.

Field of the Invention

The present invention relates to systems for
providing directory assistance services. More
particularly, the present invention relates to a
directory assistance service with flexible connection
options so that a caller can more readily communicate
with a party that is presently unavailable.

Background and Summary of the Invention

Telephone directory assistance services have
been available for the past century. While improvements
have been made over the decades, such systems are still
poorly suited for many users, including in particular,
subscribers of mobile telephone services (e.g., cellular
and personal communications service ("PCS")
subscribers).

In prior art directory assistance services, a
customer dials an operator and identifies the name and
address of a party whose telephone number is desired.
The operator then locates the number, using printed
directories or a computer database, and provides the
number to the customer. (The provision of the number is
sometimes done by the live operator, but more typically
is done with a synthesized voice response unit that
provides an automated voicing of the number.) After the
customer's inquiry has been satisfied, the connection to
the operator is terminated.

While satisfactory for most customers, this
arrangement is ill-suited for many mobile telephone
and/or PCS customers. For one, such customers are
usually away from their general work environments (e.g.,
5   in a vehicle), and thus may not have ready access to a
pencil and paper in order to make a note of the desired
number. (Even if such materials are available, the
customer may not find it convenient to interrupt other
activities, e.g., driving, in order to make a note.) In
10   addition, the process of initiating a second call -- to
the desired party -- entails further manual operations
(e.g., hanging up, waiting for another dial tone, and
dialing) which may be a hindrance to the customer's
other activities.

15   The present assignee has redressed certain of
these difficulties by providing a directory assistance
service that eliminates the need to make a note of the
desired number, or undertake a redialing exercise.
Instead, after determining the telephone number desired
20   by the customer, rather than voicing it to the customer,
the directory assistance operator proceeds to initiate a
call to the desired party, and connects the new outgoing
call to the original customer. This arrangement
obviates the need for the customer to make a note of the
25   voiced number, or to undertake a redialing exercise.
However, the number can still be voiced to the customer
if desired.

Rather than dropping all further involvement
with the call, as is typically done with most directory
30   assistance systems, the assignee's directory assistance
system continually monitors the connection thereby
established for a predetermined DTMF signal issued by
the customer, such as that obtained by pressing the
"*" button. If such a signal is detected, the customer
35   is transferred to a directory assistance operator, who
can then provide whatever further assistance is needed.
By this arrangement, the press of a single button by the
customer summons further directory assistance, rather
than the redialing procedure normally required.

However, if the initiated call is not completed because a "busy" tone is received, or a continuous ringing signal for a non-answering party is received, then the customer must either immediately contact the
5   directory assistance operator again (e.g., with the press of a single button as was described above) or hang-up and re-connect to the directory assistance operator again at a later time by undertaking a redialing exercise.
10   If the caller re-connects to the directory assistance operator, the operator can re-initiate the call, but if the line is busy, or the party is not answering, then the caller must either write down the desired number, or call the directory assistance service
15   again at a later time. Both of these options are un-satisfactory for many cellular telephone customers as they disrupt the customer's activities.

In accordance with one preferred embodiment of the present invention, a directory assistance service is
20   provided which alleviates the busy signal and non-answering parties problems. For example, in one embodiment, a caller who wishes directory assistance services is connected in the conventional manner to a directory assistance operator who determines the
25   destination telephone number desired by the caller. The operator and the system then initiates the call connection to the destination telephone number for the caller.

If a busy signal (or any other non-ringing or
30   intercept signal, e.g., re-order, disconnected number tone, tri-tone, etc.) is detected, an on-line call monitoring and reporting system drops the connection to the busy called party, and a voice response unit plays a message to the caller with the following options: (1) to
35   leave a message for the busy called party; (2) to listen to a voiced play back of the telephone number just called so the caller can write down the number for future unassisted calls; (3) continue calling the requested party every N minutes, where N is determined

by the caller or set by default (e.g., set by the
service provider); (4) call the requested party again;
(5) page the busy called party at another number; or (6)
to return to the directory assistance operator for
5   further assistance.

     If the caller chooses option (1), the caller can
record a voice message, or send an alphanumeric
character message. The caller can also choose this
option at any time by pressing the "M" (the number six)
10   key or other predetermined key(s).

     The directory assistance service will attempt
to contact the busy called party at specific durations
(e.g., once every half hour) to automatically deliver
the calling party's message (i.e., either a recorded
15   voice or an alphanumeric message). After a certain
number of unsuccessful attempts (e.g., 10 attempts), the
message delivery to the busy party is canceled. The
caller also has a "confirmation" option wherein the
directory assistance system calls the caller back to
20   confirm successful or failed delivery of the message.

     If the calling party chooses option (2), the
system provides an automated voicing of the number to
the caller. The caller can record this number for
future unassisted calls to the called party. The caller
25   can also choose this option at any time by pressing the
pound or number "#" key twice or other predetermined
key(s).

     If the caller chooses option (3), the system
will continue calling the busy party at set intervals.
30   The caller can also choose this option at any time by
pressing the "C" (number two) key or other predetermined
key(s).

     If the caller chooses option (4), the system
immediately redials the called party. If the line
35   continues to be busy, the caller can repeatedly select
this option to continue redialing the called party.

     If the caller chooses option (5), the system
pages the called party. Like option (1), the caller
also has a "confirmation" option wherein the directory

assistance system calls the caller back to confirm
successful or failed delivery of the page. The caller
can choose from a predetermined set of alphanumeric
character messages to send with the page. The caller

5   can also choose this option at any time by pressing the
"P" (number 7 key) at any time or other predetermined
key(s).

      If the caller chooses option (5), the caller is
returned to the directory assistance operator. If the

10   caller has not responded after a predetermined time-out
period, the system preferably defaults to option (5) and
automatically returns to an operator. At any time the
caller can press the star "*" key to return to an
operator. The directory assistance operator can then

15   provide further "live" assistance to the caller.

      If a ringing signal for a non-answering party is
detected, an on-line call monitoring and reporting
system would after a pre-determined interval, mute
(i.e., attenuate or remove) the ringing tone for the

20   caller while the actual ringing of the called party
continues. A voice response unit plays a message for
the caller with the following options: (1) to leave a
message for the busy called party; (2) to listen to a
voiced play back of the telephone number just called so

25   the caller can write down the number for future
unassisted calls; (3) to continue calling the requested
party at selected intervals; (4) to page the busy called
party; (5) to return to audible ringing for the call; or
(6) to return to the directory assistance operator for

30   further assistance;

      If the caller chooses option (1)-(4), the same
scenarios described above for the "busy signal" take
place. If option (5) is chosen, the system continues
ringing the called party. The system defaults to one of

35   the options (e.g., option (5)) if the calling party does
not make a selection within a predetermined time-out
period.

      The ability to leave a message or page that is
automatically delivered to a busy, or non-answering

party provides a number of benefits to the caller, the
busy and/or non-answering party, and the directory
assistance service. The caller does not have to record
the called party's phone number, or initiate a second
5   call to the directory assistance service at a later time
to try and contact the desired party whose number is not
initially known. The caller can also receive
confirmation of successful or failed delivery of the
message or page, relieving the caller of the burden of
10   checking as to whether or not the recorded message
actually did get delivered. Thus, interruptions to the
caller's activities are kept to a minimum, which is
important when the caller is using a mobile telephone or
PCS device. Minimal interruptions are also important to
15   land line callers.
        A caller can also leave a message for a busy
party, and/or a non-answering party without an answering
machine, neither of which is normally possible. In
addition, a message or page can be left with a non-
20   answering party who is using another telephone service
feature (e.g., call waiting) which would normally
prevent a caller from making a connection and leaving a
message, even if the non-answering party had an
answering machine.
25   The called party will receive messages that
could normally not have been delivered. Thus, the
called party is less likely to miss an important
message. The directory assistance service also benefits
since directory assistance operators can spend more time
30   speaking to and connecting new callers, instead of
continuously interacting with a caller who is
experiencing a busy signal, or a non-answering party.
        In another embodiment of the present invention,
a caller can provide input choices by speaking the name
35   of the input buttons that are normally pushed. For
example, if the caller was asked "to press or speak one"
for a response, the caller could speak the word "one,"
thereby choosing response number one. Therefore, a
caller who encounters a busy (or other intercept signal,

e.g., reorder, disconnected number, etc.) or non-answering party for example, can leave a recorded message for the party without any additional keypad input after dialing the directory assistance service.
5   Speaking the responses to menu questions offers a substantial benefit over directory assistance services which require telephone keypad inputs. Mobile telephone customers who may be engaged in other activities (e.g., driving a vehicle) that make it inconvenient to
10 continually press keys on the telephone keypad, can simply speak responses to menu items.

The foregoing and additional features and advantages of the present invention will be more readily apparent from the following detailed description, which
15 proceeds with reference to the accompanying drawings.

Brief Description of the Drawings

Fig. 1 is a block diagram depicting the hardware used to implement one embodiment of the present
20 invention.

Figs. 2A-2E is a flow chart depicting the process by which directory assistance messages for non-answering parties are provided to a customer in accordance with the Fig. 1 embodiment.
25 Figs. 3A-3E is a flow chart depicting the process by which directory assistance messages for busy parties are provided to a customer in accordance with the Fig. 1 embodiment.

30 ### Detailed Description

Overview of System

With reference to Fig. 1, a directory assistance center 10 according to a preferred embodiment of the present invention includes one or more T1 links 12 for
35 connection to customer networks, a private branch exchange (PBX) 14, and a channel bank 16 for coupling to a plurality of operator telephones 18. Each operator is further equipped with a terminal 20 that includes a video display unit and a QWERTY keyboard with associated

dialing pad. The operator terminals are coupled to a
terminal server 22, which in turn is connected over a
data network 24 to a database server 26. The data
network further connects to a PBX host computer 28 and a
5   voice response unit (VRU) 30. The data network consists
of, but is not limited to, a Local Area Network (LAN)
supplemented by a number of point-to-point serial data
links.

    The T1 links 12 provide connection between the
10   directory assistance center 10 and the cellular
carrier's switching center, through which incoming
directory assistance calls are received. The T1 links
12 further provide connection to the network over which
outgoing calls are placed (which network may be
15   different than that used for incoming traffic).

    The PBX 14 is conventional, and its operation is
governed by instructions stored in the PBX host computer
28. These instructions simply implement the processes
hereafter described. In the preferred embodiment, the
20   PBX supports digital T1 telephone circuits, while in
other embodiments other PBXs can of course be used.
Included in the PBX is digital signal processing
circuitry which provides the requisite conference
capability (described below), and dual tone multi
25   frequency (DTMF), and multi frequency (MF) tone
generation/detection capabilities and complete call
progress analysis (detection and reporting).

    Incoming calls received by the PBX 14 are
connected to an available operator via a T1 circuit 32
30   that is connected through the channel bank 16 to an
operator's telephone headset 18. The operator headset
can be that of a standard telephone (e.g., shown in Fig.
1), a headset which is attached to the operator's head
and allows "hands free" operation (not shown in Fig. 1),
35   or any other variety of headsets known in art. If no
operator is available when a call is received, the call
is queued until an operator becomes available. The
queuing and call distribution is standard Automatic Call
Distribution (ACD).

The terminal server 22 simply serves as an interface between serial devices, such as the operator terminals 20, and the data network 24, allowing the terminals to log in as devices on the network.

5   The database server 26 provides operators with the means to search for a customer's desired party, and determine the appropriate telephone number. In the preferred embodiment, the database provides the capability to search not just by name and address, but

10   also by type of goods/services and/or geographical region. (E.g., the preferred database can answer queries soliciting the names/numbers of shops carrying model rocketry supplies in southeast Portland, Oregon, or of Chinese restaurants on a given street.) Data

15   indexed in this fashion is usually not commercially available, so the present assignee starts with a commercially available database file (e.g., the Directory Assistance Database Source available from U.S. West), and enriches it by adding further data manually.

20   Desirably, the results of the database search presented on the operator's terminal 20 are not alphabetized prior to display, but rather are presented in the order located by the database search engine. (If desired, a deliberate randomization of order could be

25   effected before display. Businesses at the beginning of the alphabet are thereby not unduly favored by customers using the directory assistance service.)

The database software itself is conventional. The presently preferred best mode is to use a relational

30   database, such as is available from Oracle. However, much simpler software can alternatively be used, such as DBase 4.

The voice response unit (VRU) 30 is incorporated into the system to play the constantly repeated parts of

35   an operator's speech, namely the various greetings and closings. Not only does this system provide a voice-saving and monotony-relief function for the operators, it performs a 'branding' function (i.e. the pre-recorded messages incorporate the name of the telephone

company through which the customer was routed to the
directory assistance service), and it also reduces the
amount of time an operator is actually connected to a
customer.

5   The VRU 30 is connected via the data link 24 to
the PBX host 28 and, via one or more T1 spans 32, to the
PBX 14 itself. More than one VRU can exist in a system.
At appropriate stages in a call progression, the PBX
host 28 initiates a voice path connection between the
10   VRU and the PBX such that the caller, or the caller and
the operator, are able to hear whatever pre-recorded
speech is played on that circuit by the VRU 30. It then
instructs the VRU, via the data network, what type of
message to play, passing data parameters that enable the
15   VRU to locate the message appropriate to the call state,
the service-providing telephone company, and the
operator. The recording density used is high enough to
provide a sufficient quality of message playback that
most users of the system should be unaware they are
20   listening to a recording.

          The PBX 14 detects ringing and busy signals on
outgoing lines from the PBX host 28 using its complete
call progress analysis capability. The voice recording
and playback capabilities of the VRU 30 are utilized as
25   described below to provide a caller the option to leave
a recorded message for a busy or non-answering called
party. The VRU's voice record and playback capabilities
along with the PBX's dialing capabilities also are
utilized to try and contact a busy or non-answering
30   party at a later time and deliver messages and/or pages
requested by a customer as described below. Preferably,
the caller's phone number is reported to the PBX 14 in a
conventional manner as a string of data sometimes
referred to as the announced number identification
35   (ANI). The PBX 14 also utilizes a string of data
sometimes referred to as the dialed number
identification string (DNIS) as is conventionally known
for identifying a number dialed by the caller (i.e., to
the center 10) possibly with translation.

Method of Operation

Customers of a particular telephone company simply dial the access digits established for directory assistance by that company. Examples of typical access
5   digits are "*555" and "555-1212" and "411".

The participating telephone company's own switching system will then reroute the call to the directory assistance service center 10 (via a T1 channel), where it appears as an incoming call.
10   Automatic Call Distribution (ACD) logic is used to queue incoming calls in an incoming call queue, (if necessary) and distribute calls to operators in the order in which they are received, and such that the call traffic is distributed evenly among the operators.
15   When a call is connected to an operator, the VRU 30 (also conferenced into the call) plays a greeting message, using a message pre-recorded by the connected operator. Both the operator and the calling customer hear the message, which incorporates the name of the
20   service or company to which the customer is a subscriber (in other words, the call is "branded"). The message ends with a prompt, thus cuing the customer to volunteer what information they are seeking.

When the automated greeting is complete, the VRU
25   is disconnected, and the operator and the customer are left connected by a 2-way speech path. From this point, the caller is interacting with a live operator.

In the event the VRU is non-functional (for whatever reason), the incoming call is connected to the
30   operator and a short "trill," or "zip" tone is played to indicate that a caller is on the line. (Note that once operators are logged in to the system, they wear headsets, and have their telephones 18 permanently off-hook. Their telephones do not ring when a call is
35   presented.) The operator then speaks a greeting and prompt in real time, instead of the VRU playing a message.

If the caller requests information concerning, for example, local theater performances, the operator

speaks a response to the request. After the query is
answered, the caller is released from the call, and the
operator becomes available to handle further calls.

If the caller is seeking directory assistance,
5   the operator engages in live dialogue to establish the
name and other pertinent information of the wanted
party, and then initiate a database search using the
operator terminal 20 and associated database server 26.
In the event of an unsuccessful search, the operator
10   will use alternative sources, such as the Electronic
White Pages (EWP) or even printed directories.

The operator can connect the caller to the
wanted party's number using one of several possible
methods of call transfer, which include primarily Blind
15   Transfer (also known as "connect") and Hotline Transfer
(also known as "conference connect") described below,
and also several sub-options to these call transfer
methods. Alternatively, at the caller's option, the
operator or VRU 30 can simply voice the number to the
20   caller.

In either case, the call transfer is invoked by
sending a sequence of digits (that includes the wanted
party's number) to the PBX host 28. The conventional
method of doing this is simply dialing the digits on the
25   operator's telephone handset (having first depressed the
"flash" key to obtain dial tone). This method is always
available. A much quicker and more accurate call
completion method is generally preferred: the operator
highlights the desired database entry on the screen of
30   the terminal 20, and then initiates Blind or Hotline
transfer to that number by entering a few keystrokes on
the terminal keyboard. In this case, the database
server 26 transmits the same digit sequence as part of a
message to the PBX host 28, via the network 24.

35   Automated Call Completion Method

More specifically, in the preferred automated
call completion method, the operator locates the desired
listing in the database, and presses the "enter" key at
the operator terminal 20 to select the listing.

Whereupon, the operator terminal 20 displays a main call
completion menu along with a selected listing. One
example of such a menu is as follows:

5   Main Call Completion Menu
     ----
     1)   Connect with Transfer back
     2)   Connect with NO Transfer back
     3)   Conference connect with Transfer back
10   4)   Conference connect with NO Transfer back
     5)   Provide number before connection
     6)   Supervisor
     7)   Manual Dial
     8)   No connect
15

         Options (1) and (2) of the main call completion
     menu initiate the "Blind Transfer" to the selected
     listing as described more fully below. Options (3) and
     (4) initiate the "Hotline Transfer" described more fully
20   below. Option (5) initiates an automated (e.g.,
     synthesized or recorded) voicing of the wanted number to
     the calling party by the VRU 30. Option (6) is selected
     by the operator to summon the operator's supervisor for
     assistance handling the call. Option (7) overrides
25   automated dialing of the selected listing, and allows
     the operator to manually dial a number at the operator
     terminal 20. Option (8) cancels call completion.
         When the operator selects option (7), the
     operator terminal 20 displays a call completion sub-menu
30   such as follows:

     Manual Dial Call Completion Sub-Menu

     Enter telephone number _____
35   1)   Connect with Transfer back
     2)   Connect with NO Transfer back
     3)   Conference connect with Transfer back
     4)   Conference connect with NO Transfer back
     5)   Provide number before connection

6)   Supervisor

7)   Change Number

8)   No connect

5   Upon selection of any of the connection options
(1) - (4) of either the main call completion menu or
manual dial call completion submenu, the database server
26 sends a data packet to the PBX host 28, via the
network 24. The data packet contains the appropriate
10   station ID and the digit sequence of the selected
listing or manually entered telephone number in the case
of option (7). The PBX host 28 creates a conference
bridge with the caller and the called party, then either
completes the "Blind Transfer" in the case of options
15   (1) or (2) or continues with the "Hotline Transfer" in
the case of options (3) or (4). In the case of options
(1) or (3), the tone triggered return transfer operation
which is described more fully below is enabled during
the call. In the case of options (2) or (4), the tone
20   triggered return transfer or transfer back operation is
disabled as also discussed more fully below.

Blind Transfer Connection

"Blind Transfer" is the normal means by which an
operator establishes a connection between the caller and
25   the wanted party's number. As soon as the PBX host 28
receives the Blind Transfer command (whether from the
database server 26 or the operator's telephone set 18),
an attempt is made to establish a route out of the PBX
14. If successful, the circuit is seized and the
30   address digits propagated, using the protocol the
circuit is configured for: the operator is released
from the call and made available to receive further
calls. If the VRU 30 is operational, it is commanded to
play a closing message (pre-recorded by the just-
35   released operator). If the VRU is not available, the
operator speaks the closing message before initiating
the transfer. Optionally, the outgoing call set-up can
be initiated sometime before the closing message
completes (e.g., at a time equal to the average or

expected time of call set-up prior to the completion of
the closing message). The VRU status is known by
whether the call was initiated by a VRU-played greeting,
or by zip tone. Failed routing attempts cause reorder
5   tones to be returned to the operator's handset, or an
error indication to be returned to the database server
26 (depending on how the PBX host received the transfer
command).

Hot Line Transfer Connection

10   Like Blind Transfer, the "Hotline Transfer"
method of establishing a connection between the caller
and the wanted party's number can be initiated by the
operator from either the telephone handset 18 or from
the data terminal keyboard 20. The difference is that
15   the operator is not automatically released from the call
in a Hotline Transfer. Instead, he/she is conferenced
into the call by the PBX 28 and is able to monitor its
progress. Using either the telephone handset or the
data terminal keyboard, the operator may withdraw from
20   the call after verifying its establishment, or may cause
the called circuit to be released and then re-engage in
dialogue with the caller. Hotline Transfers are used
when a caller requests that the operator "stay on the
line."

25   ### Tone-Triggered Return Transfer

If, after initiation of a transfer (whether or
not it succeeds), and at any time before the caller
hangs up, the caller requires further operator
assistance, the caller can perform a tone signal
30   triggered, return transfer back to an operator
(hereinafter referred to as "tone triggered return
transfer" or "transfer back"). This is done simply by
pressing the "*" (star) key or another designated key on
the caller's telephone once or twice (depending on the
35   network, and as instructed by the operator in the
closing message).

The star or other designated key tone(s) is
detected by a DTMF receiver (allocated in the PBX 14 for
the entire duration of the call), and causes the caller

to appear as a fresh call to the ACD logic. Detection
of the DTMF tone results in the caller being placed in a
priority queue, from which the caller is connected to an
available operator. Whereupon the PBX host 28 instructs

5   the connected VRU 30 to play the appropriate pre-
recorded return greeting. Note that the call is
allocated to an operator according to the ACD algorithm,
and may or may not be the same operator that previously
handled this call.

10   The priority queue is different from the
incoming call queue in which the caller was initially
placed. The ACD algorithm allocates calls to operators
out of the priority queue first. The priority queue is
processed until it reaches some predetermined level

15 (e.g., the priority queue is empty). When an operator
becomes available and the priority queue has reached the
predetermined level, then new incoming calls are
assigned to the operator from the incoming call queue.
This gives precedence to calls already in progress (as

20 compared to newly initiated calls to the directory
assistance service).

        The "tone triggered return transfer" feature
enables callers who have been transferred to recall an
operator if the transfer does not complete

25 satisfactorily (for example, receipt of reorder tone,
busy tone, operator intercept tri-tones, ring-no-answer,
silence, or wrong number). It also enables a caller to
request a follow-on call at the completion of a
successfully completed call without incurring the delay

30 or difficulty of re-dialing into the system.

        It will be recognized that, in the preferred
embodiment, the desired number is not voiced to the
customer unless explicitly requested. Sometimes a
customer uses the "tone triggered return transfer"

35 feature to request that the number be voiced if, for
example, he or she finds a follow-up call is necessary
later.

Process for Non-Answering Party Connection Options

A flow diagram illustrating the sequence of events in a directory assistance system with connection options for a non-answering party according to the preferred embodiment of the invention is shown in the flowchart in Figs. 2A-2E.

When a call is received by the directory assistance center 10 as a result of a caller dialing the access code for the directory assistance service (step 38 of Fig. 2A), the call is either assigned immediately to an operator if any operator is available, or the PBX 14 queues the caller's call in the incoming call queue and eventually assigns the call to an operator as operators become available as described above (step 40 of Fig. 2A). When the caller is connected, the VRU 30 plays the normal directory assistance greeting (step 42 of Fig. 2A), and the caller and the directory assistance operator speak (step 44 of Fig. 2A). The operator 40 locates the number of the party desired by the caller and transfers the call (step 46 of Fig. 2A) as described above. The VRU plays a closing message and the caller is connected to an outgoing circuit to connect to the desired party (step 48 of Fig. 2A). At any time the caller can press the star "*" key to talk again to a live directory assistance operator (step 50 of Fig. 2A). The PBX uses a plurality of dedicated Digital Signal Processors (DSPs) to continuously monitor each of the lines connected to the PBX. Each DSP is assigned one or more lines to monitor continuously.

If the destination number rings for a pre-determined duration (e.g., 6 rings or a predetermined time period (e.g., 40 secs.) without answering) after a call is transferred by the directory assistance operator to a destination number (step 52 of Fig. 2B), the ringing tone is muted (step 54 of Fig. 2B) for the calling party by the PBX 14. The ringing signal actually continues on the circuit to the called party, however, the audible ringing tone is no longer sent to the caller.

After muting the audible ringing tone for the
caller, the PBX 14 instructs the VRU 30 to play a
message to the caller providing available options for
the caller (step 56 of Fig. 2B). For example, in the
5   preferred embodiment of the present invention, the
following options are included for the caller by the
voice playback unit for a non-answering called party:

        Non-Answering Called Party Initial Main Menu
10   1. If you would like to leave a message for this non-
answering party, please press (or speak) one now.
            2. If you would like to receive the number of this non-
answering party, please press (or speak) two now.
            3. If you would like to call this non-answering party
15   every N minutes, please press (or speak) three now.
            4. To page this non-answering party, please press (or
speak) four now.
            5. To continue holding for an answer, please press (or
speak) five now, and stay on the line. Audible ringing will be
20   returned to your call.
            6. To hang up, please press (or speak) six now, or hang
up your receiver.
            7. To return to an operator for further assistance,
please press star at any time.
25
However, more or fewer options could be included in this
menu. Further, the menu can be arranged as a multi-
level menu tree, with menus of additional sub-options
accessed by selecting a main option from the initial
30   main menu. In another embodiment of the present
invention, the following options are included in the
initial main menu for the caller by the VRU 30 for a
non-answering called party:
        Non-Answering Called Party Alternative Main Menu
35   1. If you would like to leave a message for this non-
answering party, press the "M" key at any time.
            2. If you would like to receive the number of the non-
answering party, press the pound key twice at any time.
            3. If you would like to call the non-answering party
40   every N minutes, press the "C" key at any time.

        4. To page the non-answering party, press the "P" key at
any time.
        5. To continue holding for an answer, stay on the line.
Audible ringing will be returned to your call.
 5   6. To hang up, hang up your receiver.
        7. To return to an operator for further assistance,
please press star at any time.

        Message Option (1)

10   If a caller chooses option (1) by pressing the
one key on the telephone, or by pressing the "M" (six
key) at any time if the alternate initial main menu is
used 58, the VRU 30 plays a submenu which asks the
caller if they wish to leave a recorded message, an
15 alphanumeric message typed by a directory assistance
operator, or an alphanumeric message from a pre-
determined set of alphanumeric messages for the called
party.
        If the caller wishes to leave a recorded voice
20 message for the non-answering party, the VRU 30 plays
another submenu which includes notifying the caller that
additional fees will be charged. The caller is given an
option of accepting this service by pressing the one key
(i.e., "yes") , or declining this service by pressing
25 the two key. Other keys for yes and no could also be
used (e.g., nine key for yes, and six key for no, etc.).
If the two (i.e. "no") key is pressed, the next
appropriate submenu (e.g., to choose a pre-determined
alphanumeric message). is played for the caller by the
30 VRU 30. If the caller desires to leave a message (i.e.,
a recorded voice message or a pre-determined
alphanumeric message) and agrees to accept the charges
for message delivery, the VRU 30 terminates the
connection to the ringing non-answering called party
35 (step 60 of Fig. 2B), and queries the caller for message
information (step 62 of Fig. 2B). For example, in the
preferred embodiment of the present invention, the query
information to leave a recorded message would include:

-Recorded Message Queries-

(a) *Please leave a message for_____*

(b) *This message is from_____*

(c) *The message to be delivered to "response from (a)"*

5   *from "response from (b)" is _____*

(d) *Do you want to configure the time interval and number*
of attempts to contact "response from (a)"? Press (or speak) one
for yes, or two for no.

(e) *Do you want the system to call you back and confirm*

10   *successful or failed delivery of this message? Press (or speak) one*
for yes, or two for no.

         As indicated, the caller also has the option of
configuring the time interval and number of attempts

15   used to contact the non-answering party to deliver the
recorded message. If the caller does not want to
configure call back parameters, default call back
parameters are used (e.g., at time intervals set to
every half-hour, and number of attempts set to ten).

20   If the caller chooses option (e) after recording
a message, the VRU 30 and PBX 14 automatically contact
the caller at a later time to confirm the recorded
message was delivered, or the message delivery failed.
If this option is chosen, the VRU 30 records the

25   caller's phone number to allow the directory assistance
center to contact the caller at a later time.
         The VRU 30 will attempt to contact the non-
answering party at specific durations (e.g., once every
half hour) to automatically deliver the calling party's

30   message. Preferably, the VRU 30 utilizes the Message
Delivery With Called Party Type Detection described more
fully below. For managing the message delivery
attempts, the VRU 30 records a message delivery status
and a count of failed delivery attempts. When a message

35   delivery attempt succeeds, the message delivery status
is set to success. If a message delivery attempt is
unsuccessful, or the call is answered, but the called
party is not available, the message delivery status is
set to failure and the count of failed delivery attempts

40   is incremented. When the mail delivery status is set to

success, or the count of failed delivery attempts
reaches the number of attempts set by the caller or by
default, the recorded message delivery is canceled. The
message delivery status (i.e., success or failure) is
5   reported to the caller when the VRU 30 and the PBX 14
calls the caller back (if the call back and confirm
option is set by the caller or by default).

      The caller can also leave an alphanumeric
message (step 62 of Fig. 2B) for a non-answering party
10   by choosing option (1) from the Non-answering Party Main
Menu (described above) and a suboption for alphanumeric
messages under a submenu for option one. One sub-option
allows the caller to dictate an alphanumeric message
which will be typed by a directory assistance operator.
15   The caller is returned to an operator to dictate the
message if this sub-option is chosen. A second sub-
option allows the caller to choose an alphanumeric
message from a set of predetermined alpha numeric
messages.

20   A dictated or pre-determined alphanumeric
message is used when the number for the non-answering
party is for a Personal Communications Service (PCS)
device, FAX, or other device which can receive and
display alphanumeric text.

25   For example, in the preferred embodiment of the
present invention, the predetermined set of alphanumeric
messages includes:

      -Predetermined Alpha numeric message queries-
30   The following alphanumeric message are available. Please
choose an alphanumeric message query by pressing the appropriate
key:
      1. Please call me back at _____ (caller inputs
phone number).
35   2. Please call home.
      3. Please call the office.
      4. Please call me back after _____ (caller
inputs time).
      5. Please call me back on _____ (caller inputs
40   date).

However, more or fewer options could be included
in the alphanumeric message query submenu. As can be
seen from the alphanumeric message query submenu, there
5   are multiple pre-determined alphanumeric messages (2,3),
and multiple messages which require numeric input from a
caller (1,4,5) (e.g., require a telephone number). If
the caller chooses an alphanumeric submenu item which
requires numeric input, the numeric input is completed
10   by pressing the appropriate keys on the telephonic
device. The dictated or predetermined alphanumeric
message is delivered in the same manner as was described
above for the recorded voice message. The success or
failure of an alphanumeric message delivery can also be
15   verified by a call back to the caller at the caller's
option as was described above.

Called Number Play Back Option (2)

If the caller chooses option 2 from the non-
answering called party menu above, or presses the pound
20   or number "#" key twice if the alternate initial menu is
used (step 64 of Fig. 2C), the VRU 30 will play a
submenu for option 2 which includes voicing the number
of the non-answering party to the caller (step 66 of
Fig. 2C). The caller can then record the number'to call
25   the non-answering party at a later time without further
directory assistance. The submenu for option 2 may also
contain more or fewer options.

Connect At N Minute Interval Option (3)

If the caller chooses option 3 from the non-
30   answering called party menu described above, or presses
"C" (two key) if the alternative initial menu is used
(step 68 of Fig. 2C), the VRU 30 will play a submenu for
option 3 which includes having the directory assistance
service connect back to the non-answering party every N
35   minutes (step 70 of Fig. 2C), where N is preferably
determined by the caller. The submenu preferably has
the following form:

-Connect Every N Minutes Submenu-

```
(a)  The connect interval (i.e., N) is _____
(b)  This message is from_____
(c)  The time limit for connect every N minutes is
```

5   (d) The phone number for calling back is _____
             You may now hang up, or press the star key to return to an
operator.

In an alternative embodiment of the present invention,
10   the connect interval N is not configurable by a caller,
and a default connect interval N is set by the service
provider. The submenu for option 3 may also contain
more or fewer options. After the caller has set the
options for connecting every N minutes, the caller can
15   hang up or press the star key to have the operator place
another call.
        In the preferred embodiment, the directory
assistance center 10 attempts to connect to the called
party at the connect interval set by the caller or by
20   default. If there is still no answer in the time limit
set by the caller or by default, the directory
assistance center 10 connects back to the caller and the
VRU 30 reports failure to connect to the called party.
        If the called (non-answering) party answers on
25   any of the directory assistance center's attempts to
connect within the time limit, the VRU 30 plays the
recorded message as follows:

Hello, this is <service provider name>, you have a call from <name
30   of caller>, please stay on the line while we connect you to <name of
caller>

where <service provider name> is the name of the
directory assistance service or the name of the
35   telephone service provider of the caller, and <name of
caller> is the name input by the caller in response to
the Connect Every N Minutes Submenu above. The
directory assistance center 10 will then attempt to
connect the called party back to the caller.

If the caller does not answer the call back
within a predetermined period or a busy signal or other
intercept signal is received, the VRU 30 voices the
following to the called party:

5

We have been unable to connect you with <name of caller>, however
the phone number at which you can reach <name of caller> is
<caller's phone number>.

10   where <name of caller> is the name provided by the
caller in response to the Connect Every N Minutes
Submenu described above, and <caller's phone number>
also is the number provided by the caller in response to
the submenu or the ANI data string from the caller's
15   original call to the directory assistance center 10.
        In an alternative embodiment, the directory
assistance center 10 first connects to the caller before
making each attempt to connect to the called party at
each connect interval. The directory assistance center
20   10 is thereby sure to be able to connect the called
party to the caller if the called party answers. In
either case of the preferred embodiment or the
alternative embodiment, the VRU 30 preferably voices an
explanation of the operation of the connect every N
25   minutes option when it is selected by the caller.
        Page Option (4)
        If the caller chooses option 4 from the non-
answering called party menu, or presses "P" (seven key)
at any time if the alternate initial menu is used (step
30   72 of Fig. 2C), the VRU 30 will play a submenu for
option 4 which includes sending a recorded voice page or
a pre-determined alphanumeric text page using a pager
number (step 74 of Fig. 2C). The submenu for option 4
may also contain more or fewer options. The recorded
35   voice page and pre-determined alphanumeric text page are
selected from submenus, sent and confirmed in a manner
similar to that discussed for the recorded voice message
and pre-determined alphanumeric message described for
option 1 above. The directory assistance service sends
40   the page to a pager, PCS, or other number capable of

accepting a page associated with the non-answering
party. The caller also has the option of obtaining a
pager, PCS, etc., number from a directory assistance
operator.

5   Return to Ringing Option (5)

          If the caller chooses option 5 from the non-
answering called party menu (step 76 of Fig. 2D), the
audible ringing is returned to the caller (step 78 of
Fig. 2D). If there is still no answer after an
10   additional period of the defined number of rings with no
answer (e.g., 6 rings as defined by the directory
assistance center) (step 52 of Fig. 2B), the VRU 30
again mutes the audible ringing tone 54 and re-plays the
recorded Non-Answering Called Party Menu described above
15   (step 56 of Fig. 2B).

          Hang Up Option (6)

          The caller can terminate the call by hanging up
at any time, or by choosing option (6) and then hanging
up (step 80 of Fig. 2D). When the caller hangs up, the
20   connection to the called party and the directory
assistance service is dropped (step 82 of Fig. 2D).

          Return to Operator Option (7)

          If the caller selects option (7) by pressing the
star key or seven key as indicated in the menu, the
25   caller is returned by the directory assistance center 10
to a live operator as described above for a tone-
triggered return transfer.

          Default Action

          In the preferred embodiment, the directory
30   assistance center 10 defaults to one of the options if
the caller does not make any inputs for a pre-determined
time period (e.g., ten seconds). The preferred default
option is to return audible ringing to the line for the
caller (i.e., option (5) is the default).

35   Alternatively, the default option is to return the
caller to a live directory assistance operator (step 86
of Fig. 2A) as if the caller had selected option (7).
If the return to operator default is used, the PBX 14
ceases ringing to the called party. The VRU 30 will

then play the proper return greeting (step 88 of Fig.
2A), and the caller again speaks with a directory
assistance operator (step 44 of Fig. 2A). Also, at any
time during or after hearing the Non-Answering Called
5   Party Menu and/or submenu options, the caller can press
the star "*" key (step 90 of Fig. 2D) to again talk to a
live directory assistance operator.

       If the called party answers (step 92 of Fig. 2E)
the call at any time during voicing the menu and submenu
10   options, the VRU 30 will stop playing the menu and the
connection to the called party will proceed as usual
(step 94 of Fig. 2D). The caller and the called party
will be connected, and can then engage in a voice
conversation. The PBX 14 continues to continuously
15   monitor the connection during the conversation. If the
caller presses the star key at any time, the caller is
returned to the operator (step 86 of Fig. 2A).
Post Call Termination Activity

       After the called party terminates the call (step
20   96 of Fig. 2E) (i.e., the called party hangs up), the
caller can stay on line for further directory assistance
options or immediately press the star key "*" (step 50
of Fig. 2A) to again talk to a live directory assistance
operator. If the caller stays on the line after call
25   termination, the VRU 30 is connected to the caller and
voices the following call termination menu:

The number of the party you called is <called party's number>. You
can press the star key to return to an operator, or press the pound
30   key to repeat this message, or hang up.

where <called party's number> is the number of the
called party of the just terminated connection. If the
caller presses the star key in response to this menu,
35   the directory assistance center returns the caller to an
operator as described above for a tone-triggered return
transfer. If the caller presses the pound key, then the
VRU 30 again voice the menu (including the number of the
called party).

In alternative embodiments, the VRU 30 can play
an alternative call termination menu with more or fewer
options. For example, playing the number of the called
party back to the caller can be an option which must be
5   selected by the caller. The menu also can include a
further option to have the directory assistance center
disconnect from the caller.

The directory assistance center 10 terminates
the connection from the caller only when the caller
10   hangs up (step 80 of Fig. 2D) or affirmatively chooses a
menu option for the directory assistance center to
disconnect, or the caller does nothing for a
predetermined time out period (e.g., 30 seconds).

Sending a Called Number Page

15   After the completed call has been terminated
(e.g., the caller has terminated the call), the
directory assistance center 10 in the preferred
embodiment sends an alphanumeric page using a paging
protocol (e.g., telocator alphanumeric paging protocol
20   (TAP), telocator data protocol (TDP), etc.) to the
caller's telephonic device if the caller's telephonic
device is capable of accepting such a page. The
directory assistance center determines if the caller's
telephone is capable of accepting a page by checking
25   attributes of the caller's telephone number in the
directory assistance database. The page includes the
name for the called party (e.g., Smith, Jane M.) and the
telephone number for the called party (e.g., 503-234-
5678). If the caller has telephonic equipment capable
30   of accepting paging protocols (e.g., a mobile phone, a
PCS device, a pager, etc.) and storing such paging
information, the name and number of the called party is
then automatically stored in the caller's telephonic
device. When the caller later desires to again call the
35   called party, the caller can recall the stored number
from his/her telephonic device and attempt to complete
the call without help from the directory assistance
center.

Process for Busy Party Connection Options

If a busy signal is detected by the PBX 14, a process comprising the steps 98-150 shown in Figs. 3A-3E is performed. These steps are similar to those just described for a non-answering party. For example, in the preferred embodiment of the present invention, the following options are provided for the caller by the VRU 30 (step 116 of Fig. 3A) for a busy called party:

Busy Signal Called Party Initial Main Menu

1. If you would like to leave a message for this busy party, please press (or speak) one now.

2. If you would like to receive the number of this busy party, please press (or speak) two now.

3. If you would like to call this busy party every N minutes, please press (or speak) three now.

4. To page this busy party, please press (or speak) four now.

5. To call the busy party again, please press (or speak) five now.

6. To hang up, please press (or speak) six now or hang up your receiver.

7. To return to an operator for further assistance, please press star at any time.

Again, more or fewer options could be included in this menu and submenus could be used. In an alternative embodiment of the present invention, the following options are included for the caller by the voice playback unit for a non-answering called party:

Busy Called Party Alternative Main Menu

1. If you would like to leave a message for this busy, press the "M" key at any time.

2. If you would like to receive the number of this busy, press the pound key twice at any time.

3. If you would like to call the busy party every N minutes, press the "C" key at any time.

4. To page the busy party, press the "P" key at any time.

5. To call the busy party again, press the "1" key at any time.

6. To hang up, hang up your receiver.

7. To return to an operator for further assistance, please press star at any time.

5   The options for a busy party (i.e., steps 98-148 Figs. 3A and 3B) are similar to those just described for a non-answering party. However, when a busy signal is encountered, the connection to the busy party is dropped since the called party was busy, and not non-answering.

10   As a result, the caller cannot continue ringing the called party's line (e.g., as the caller could by selecting option 5 in the Non-Answering Called Party Menu and description above). Instead, when the caller selects option (5) in the Busy Signal Called Party Menu

15   (step 152 of Fig. 3C), the PBX 14 initiates a new call to the called party (step 154 of Fig. 3C). The caller thus can repeatedly call the called party by selecting option (5) in the Busy Signal Called Party Menu each time a busy signal is received, until the called party's

20   line is no longer busy and a subsequent new call to the called party succeeds in ringing the called party's line.

     In the case where the caller takes no action within a predetermined time period (e.g., 10 seconds),

25   the directory assistance center 10 can default to one of the options. The preferred default action is to call the busy called party again (as for option (5)). Alternatively, the default action is to return the caller to a directory assistance operator as for option

30   (7).

Message Delivery With Called Party Type Detection

     As was described above, if the caller leaves a message or page for a busy party, the VRU 30 will attempt to deliver the message or page at a later time.

35   At intervals definable by the caller and/or the directory assistance service (e.g., every 30 minutes), the VRU 30 attempts to deliver the message or page by calling the non-answering or busy party.

If during any attempt to deliver a message or
page the called party answers, or the called party's
answering machine or automated answering service
answers, a determination is made if the called party is
5   a "live person" or is an answering machine or automated
answering service. The VRU detects whether the
answering called party is: (1) a called party with a
residential phone or personal communications device
capable of voice; (2) a called party with a business
10   phone; or (3) an answering machine or automated
answering service (e.g., voice mail, etc.). However,
the VRU detection of the called party is not limited to
the equipment in this list. The VRU can be configured
to detect additional types of called parties.

15   The VRU examines the energy and duration of the
voice response when the call is answered to make a
determination of what the answering called party
actually is. For example, a called party on a
residential phone is typically characterized by a short
20   burst (e.g., < 1 second duration) of voice response
energy (e.g., by answering "hello..."). A called party
on a business phone is characterized by a longer burst
(e.g., > 1 second and < 3 seconds of duration) of voice
response energy (e.g., by answering, "good afternoon,
25   this is <business name>, can I help you?"). An
answering machine or automated answering service is
characterized by a long burst (e.g., > 3 seconds
duration) of voice response energy (e.g., for an
answering machine, "hi, this is me, I can't come to the
30   phone right now, if you want to leave a message, please
leave your name, number...", for an automated answering
service "your call is being answered by service XYZ, the
party you are trying to reach is unavailable, please
leave a message..."). Upon determination of the type of
35   answering called party, the VRU will play the
appropriate message or message menu.

When the VRU detects a residential phone or PCS
device capable of accepting two-way voice information,
the VRU plays a message menu that includes:

This is the directory assistance center, we have a
message for <called party's name>, if this is <called
party's name> please press one. If this is not <called
party's name>, but <called party's name> is nearby, please
5   press two to hold this message for <called party's name>.
Press three to continue at any time. If this is not
<called party's name>, please press four, and the
directory assistance center will try again to contact
<called party's name> at a later time.
10
where <called party's name> is the name of the called
party input in response to the message options submenu.
     When the VRU detects a business phone, the VRU
plays a message menu that includes:
15
This is the directory assistance center, we have a
message for <called party's name>. If you can transfer
this call to <called party's name>, please press one, then
transfer this call to <called party's name>. Please press
20   two after the call has been transferred to <called party's
name>. If this is not <called party's name> but <called
party's name> is nearby, please press three to hold this
message for <called party's name>. Press four to continue
at any time. If <called party's name> is not available or
25   you cannot transfer this call to <called party's name>
please press five, and the directory assistance center
will try again later to contact <called party's name>.

where <called party's name> is the name of the called
30   party input in response to the message options submenu.
     When the VRU 30 detects an answering machine or
automated answering service, the VRU 30 waits for the
"beep" or "tone", and then delivers the message left by
the calling party. The VRU 30 also records the date and
35   time the message was delivered.
     When the "live" answering called party is
reached, the called party is told that they have
messages. The VRU 30 will play a menu which includes:

40   Recorded Message Menu

1. press the one key to hear the recorded message.
2. press the two key to replay the recorded message.
3. press the three to connect back to the party who left you a message.
5
4. press the star key for operator assistance.

However, more or fewer menu items could also be
used. If the called party presses one, the recorded
message from the caller is played. The called party can
replay the message multiple times by pressing the two
10   key. If the called party presses three, an attempt is
made to reconnect the called party to the calling party
who left the message. The called party can request
operator assistance at any time by pressing the star key
15   (i.e. for a star return). A sub-menu may be included
under each of the menu items to further define available
options for the called party.
If the message or page delivery is
unsuccessful,(i.e. the called party didn't answer), the
20   directory assistance center 10 records the unsuccessful
delivery attempt. After a predetermined number of
attempts (e.g., 10, as defined by the caller and/or the
directory assistance center), the message or page
delivery is canceled, and a failed message or page
25   delivery status is recorded as described previously.
If the caller has chosen the option of having
the directory assistance system contact the caller to
confirm the message or page delivery, then the directory
assistance center will contact the caller using the
30   caller's phone number recorded earlier (i.e., the ANI
data string from the caller's original call to the
directory assistance center 10). The confirmation
message will be sent immediately after a successful
message or page delivery. If the message or page
35   delivery is unsuccessful, the failure notification
message will be delivered after a failure of the
predetermined number of unsuccessful attempts as defined
by the caller and/or directory assistance center.
Billing for Directory Assistance Services

When a caller uses any of the features described above, the caller is given an approximate idea of the cost of the service, and is asked if they agree to be billed for the service. For example, the caller may be told by the VRU 30, "A recorded message can be left for an additional $1.75 message delivery fee, plus connect time charges if any. Do you agree to accept this charge? Press one for yes or speak 'yes' now." The billing can optionally include a fee (such as the message delivery fee stated in the example), and preferably includes the cost of any connect time charges incurred when performing the service (e.g., long distance tolls and mobile phone air time charges incurred when attempting to deliver a recorded message).

If the caller agrees, the caller is billed through his/her own service provider for any costs incurred. In addition, any long distance charges, cellular, PCS, or page, charges, directory assistance charges, local connect time charges, etc. that are incurred by the directory assistance center are recorded for billing to the caller. The directory assistance center records all such transactions in their database, and then provides billing data to the appropriate service provider for the caller.

Additional Directory Assistance Options

A caller is also provided with a number of options for call backs and other message or page delivery. For example, a caller may not wish to have a non-answering or busy party call them back on the device in which they initiated the call to the directory assistance center (e.g., a cellular phone was used to call the directory assistance center, and the caller must pay for calls both to and from this cellular phone). Thus, the directory assistance center allows the caller to select from a number of options to receive a call back from a non-answering or busy party (e.g., enter the number of a land line telephone device instead of a cellular phone).

Caller Accepts Called Party Charges Service

In another embodiment of the present invention, the directory assistance center provides a service to obtain phone numbers specifically for cellular phones, PCS and other communications devices of a desired party that are not directly connected to a dedicated land telephone line. A caller can request such a number from the directory assistance operator. The directory assistance center will then try to make the proper connection to the communications device of the called party.

In yet another directory assistance service, a service is provided that allows parties to only receive calls from callers that have agreed to pay all connection and air-time charges. For example, a caller may wish to contact a called party on a mobile or cellular phone. It is typical for a party who subscribes to telephonic service for mobile or cellular phone to pay for connection and air-time for both incoming and outgoing calls. A called party may not wish to accept a call from a caller if the called party has to pay for incoming connection and air-time charges. To address this problem, the directory assistance center maintains in their databases a listing of parties who will not accept calls from a caller if the caller does not pay all charges for the call. When a caller desires to contact such a party, the directory assistance center will inform the caller that the party he/she is trying to reach will not accept a call unless the caller pays all charges. The call will be connected only if the caller agrees to pay all charges.

Option Selection by Voice

In yet another embodiment of the present invention, a caller has the option of not only pressing a key in response to any of the menus presented by the voice recognition unit, but also speaking the response to any or all menu/submenu items. For example, the menu item may say (as was shown above):

press the one key or speak the word "one" to leave a
message for this non-answering party.

The caller could then press the one key, or speak the
5   word "one" to leave a recorded message. A voice
response unit interprets spoken commands from a caller.
Speaking the responses to menu questions offers
advantages to cellular telephone customers who may be
engaged in other activities (e.g., driving a vehicle)
10   that make it inconvenient to press keys on the telephone
keypad.
The caller also has the option of customizing
the message or page delivery using voice inputs. The
caller can set a number of options (e.g., number of
15   delivery attempts, etc.) by speaking numbers associated
with the menu/submenu options.
Menu Repeat Option
In some alternative embodiments of the
invention, each of the above described menus can include
20   as an option for selection by the caller (or called
party for message delivery menus) to have the VRU 30
repeat the menu. This option preferably is voiced in
the menu, such as by the following:

25   (8) If you would like to have this menu
repeated, press (or speak) eight now.

Personalized Directory Service
In a further embodiment of the invention, the
30   directory assistance center 10 provides personalized
handling of directory assistance calls based on the
caller's phone number (i.e., based on the ANI data
string transmitted by the telephone network to the PBX
14 with the incoming call). In particular, the PBX 14
35   assigns the call to an operator based on the caller's
phone number. The database server preferably maintains
a database of caller ANIs, which associate attribute
values relating to attributes of the caller with the
caller's ANI. For example, the attribute values can

identify the caller's preferred language (such as
Spanish for a spanish speaker), or that the caller is a
preferred customer. The attribute values associated
with the caller's ANI also can specify data for the

5   voiced greetings, closings, and menus in the above
described processes. For example, the caller's name,
personalized sets of options for the menus, and default
options for the menus can be specified.

        When a call is received at the PBX 14, the PBX

10   retrieves the attribute values associated with the ANI
of the call from the database and allocates the call to
an operator accordingly. For example, if the attribute
value identifies the caller as being a Spanish speaker,
the PBX 14 routes the call to a Spanish speaking

15   operator. If the attribute value identifies the caller
as a preferred customer, the PBX 14 routes the call to
one of group of more experienced operators or
prioritizes the call in call queue(s).

        Additionally, the VRU 30 voices the various

20   greetings, closings, and menus based on the caller's
phone number. The VRU 30 retrieves the attributes
associated with the caller's ANI from the database. The
VRU 30 then voices greetings, closings, and menus
personalized according to the data associated with the

25   caller's ANI at the appropriate times in the processes
shown in Figs. 2A-2E and 3A-3E. For example, where an
attributes value associated with the caller's ANI
specifies the name of the caller (i.e., <caller name> in
the following greeting), the VRU 30 voices greetings and

30   closings, such as, "Hello, Mr.(Ms.) <caller name>, your
directory assistance call is being handled by <service
provider or operator name>, how can we help you?" As
another example, where the attribute values specify
default options (e.g., for connect interval, time limit,

35   call back number, etc.) of the connect every N minutes
option), the directory assistance center 10 applies
these options without having the VRU 30 voice submenus
to the caller for setting these options.

The attribute values to be associated with caller's phone numbers in the database (such as the phone numbers of Spanish speakers, default directory assistance options, etc.) can be obtained by the directory assistance center from the telephone provider. The telephone provider can gather this data, for example, from surveys sent with billing materials, or other means.

In view of the many possible embodiments to which the principles of our invention may be put, it should be recognized that the detailed embodiments are illustrative only and should not be taken as limiting the scope of our invention. Rather, we claim as our invention all such embodiments as may come within the scope and spirit of the following claims and equivalents thereto.

WE CLAIM:

1. An enhanced method of providing telephone directory assistance service at a directory assistance center, comprising the steps:

5   (a) receiving a customer call from a calling customer;

(b) connecting the calling customer to a directory assistance operator;

(c) locating a destination telephone number of
10   a desired party wanted by the calling customer in a computer database;

(d) initiating a telephone call between the calling customer and the destination telephone number responsive to operator selection of the destination
15   telephone number and one of a plurality of connection options, at least one of the connection options including the following steps:

(e) monitoring said telephone call for a predetermined call status signal of a predetermined call
20   status duration and,

(f) after said predetermined call status duration of predetermined call status signal has been detected, playing a recorded menu of options for the calling customer, the recorded menu allowing the calling
25   customer to select from a plurality of options with a predetermined caller input signal;

(g) monitoring said telephone call for said predetermined caller input signal issued by the calling customer responsive to said recorded menu; and
30   (h) taking action based on said predetermined caller input signal issued by the calling customer.

2. The method of claim 1, where the predetermined signal is a ringing signal, the method
35   further comprising:

detecting the existence of said ringing signal;

muting the ringing signal for the calling customer while continuing to ring the destination telephone number; and

repeating steps (f)-(h).

3.   The method of claim 2 which includes
returning audible ringing to the calling customer and
repeating steps (e)-(h).

4.   The method of claim 1, where the
predetermined signal is a busy signal, the method
further comprising:
        detecting the existence of said busy signal; and
        dropping said telephone call to said destination
telephone number.

5.   The method of claim 1 where the plurality
of options comprises: leaving a recorded voice message
for a desired party, leaving a pre-determined
alphanumeric message for the desired party, leaving a
dictated message for the desired party, playing an audio
"voicing" of the number of the desired party, calling
the desired party back every N-minutes, where N-minutes
is chosen by the calling customer, leaving a recorded
voice page for the desired party, leaving a pre-
determined alphanumeric page for the desired party,
hanging up, or being returned to a directory assistance
operator.

6.   The method of claim 1 further comprising:
        determining whether the calling customer wishes
to record a voice message for a non-answering party
which will be delivered at a later time, and if so,
        terminating said telephone call to the
destination telephone number, and
        allowing the calling customer to record the
voice message to be delivered to the non-answering party
at a later time.

7.   The method of claim 6 which further includes allowing the calling customer to determine how many attempts will be made to deliver the recorded voice message.

5

8.   The method of claim 6 which further includes calling the calling customer back at a later time to confirm successful or failed recorded voice message delivery.

10

9.   The method of claim 6 where the recorded voice message is a recorded voice page.

10.   The method of claim 1 further comprising:

15   determining whether the calling customer wishes to leave an alphanumeric message for a non-answering party which will be delivered at a later time, and if so,

        terminating said telephone call to the
20 destination telephone number, and

        allowing the calling party to leave an alphanumeric message to be delivered to the non-answering party at a later time.

25   11.   The method of claim 10 in which the alphanumeric message is created by the directory assistance center from voice dictation by the calling customer.

30   12.   The method of claim 10 in which the alphanumeric message is selected from a predetermined set of alphanumeric messages.

        13.   The method of claim 10 in which the
35 alphanumeric message is an alphanumeric page.

14. The method of claim 10 which further includes calling the calling party back at a later time to confirm successful or failed alphanumeric message delivery.

15. The method of claim 10 which further includes allowing the calling customer to determine how many attempts will be made to deliver the alphanumeric message.

16. The method of claim 1 further comprising:
determining whether said predetermined caller input signal is a return-to-operator signal, and if so,
having a PBX reassign an operator to the calling customer,
playing a return greeting for the calling customer, and
re-connecting the calling customer to a directory assistance operator.

17. The method of clam 16 wherein the return-to-operator signal is a DTMF tone for the star key on a telephonic keypad.

18. The method of claim 1 in which the predetermined caller input signal is a voice response from the calling customer.

19. The method of claim 1 in which the predetermined caller input signal is a DTMF tone response.

20. The method of claim 1 which includes continuously monitoring said telephone call using a dedicated monitoring device.

21. A method of providing telephone directory assistance service at a directory assistance center, the directory assistance center in communications with a calling customer, and a telephonic service provider providing telephonic services to the calling customer, the steps comprising:

providing a plurality of directory assistance services to the calling customer, the directory assistance services including providing a number of a desired party, leaving a message for the desired party, paging the desired party, and connecting the calling customer to the desired party; and

providing billing information to the telephonic service provider providing telephonic services to the calling customer for all directory assistance services provided by the directory assistance center to the calling customer.

22. The method of claim 21 which includes leaving a recorded voice message for the desired party.

23. The method of claim 21 which includes leaving a dictated alphanumeric message for the desired party, where the alphanumeric message is dictated to a directory assistance operator at the directory assistance center.

24. The method of claim 21 which includes billing the service provider of the calling customer for message delivery, services, page delivery services, connection time to the directory assistance service, and connection time to the desired party.

25. A method of providing telephone directory assistance service at a directory assistance center, the telephone directory assistance service including delivering a message to a called party comprising the steps:

completing a telephonic connection to a
destination telephone number of the called party to
deliver said message;

detecting a duration of voice response energy at
5   the destination telephone number;

classifying an answer to the telephonic
connection at the destination telephone number out of a
plurality of types of answer; and

taking a different delivery action according to
10   the type of answer.

26. The method of claim 25 wherein the step of
taking a delivery action comprises for at least one of
the types of answer:
15   playing a predetermined menu containing a
plurality of options selectable by a party at the
destination telephone number for accepting delivery of
said message.

20   27. The method of claim 25 wherein the types of
answer comprise an answer by a residential party, an
answer by a business party, and an answer by an
automated answering equipment.

25   28. The method of claim 25 wherein the types of
answer comprise an answer by a residential party, the
method comprising:
where the type of answer is the answer by a
residential party, playing a menu with a set of options
30   including at playing said message, and holding until the
called party arrives.

29. The method of claim 25 wherein the types of
answer comprise an answer by a business party, the
35   method comprising:
where the type of answer is the answer by a
business party, playing a menu with a set of options
including at least transferring to an extension of the
called party, and playing said message.

30. The method of claim 25 wherein the types of answer comprise an answer by automated answering equipment, the method comprising:

where the type of answer is the answer by an
5   automated answering equipment, playing said message on said telephonic connection.

31. A method of directory assistance that includes providing a plurality of services to a calling
10   customer, the services including connecting a calling customer to a directory assistance operator, the steps comprising:

providing a first queue to sequence calling customers to available operator;
15   providing a second queue, different from the first queue, to sequence calling customers who have been returned to an operator by a directory assistance service using a predetermined DTMF tone;

servicing the second queue until the second
20   queue reaches a predetermined level; and

servicing the first queue until the first queue until the first queue is empty.

25   32. The method of claim 31 in which the predetermined level for servicing the first queue is an empty level in the second queue.

33. A method of directory assistance that
30   includes providing a plurality of services to a calling customer, the steps comprising:

providing a directory assistance service to a calling party that provides the numbers of telephonic devices which are not telephonic devices connected to a
35   dedicated land telephone line;

locating a number of a desired telephonic device that is not connected to a dedicated land telephone line using said distinct directory assistance service; and

connecting said calling party to said desired
telephonic device using said number.

34. The method of claim 33 in which the
5   telephonic device not connected to a dedicated telephone
line include mobile phones, pagers, and personal
communication services devices.

35. A method of directory assistance that
10 includes connecting a calling customer to a desired
number wherein the calling customer is being provided
telephonic services by a telephonic service provider and
the desired number is assigned to a telephonic device
not connected to a dedicated land telephone line, the
15 steps comprising:
asking if said calling customer will accept all
charges for connection to said desired number, and if so
connecting the calling customer to the desired
number which is assigned to a telephonic device not
20 connected to a dedicated telephone line, and
providing billing information to the telephonic
service provider providing telephonic service to the
calling customer for all charges for said connection.

25   36. The method of claim 35 in which the
telephonic device not connected to a dedicated telephone
line includes mobile phones, pagers, and personal
communication services devices.

30   37. A method of directory assistance providing
directory assistance service at a directory assistance
center, where the directory assistance center is in
communications with a calling customer, and the calling
customer is identified at the directory assistance
35 center by a calling customer telephone number, the
method comprising:
locating a destination telephone number for the
calling customer;

initiating a telephonic connection between the
calling customer and the destination telephone number;
monitoring the telephonic connection for a
termination signal from the calling customer; and

5   upon detection of the termination signal,
sending an alphanumeric page from the directory
assistance center to the calling customer telephone
number, said page including the destination telephone
number and name of a party associated with the
10   destination telephone number.

38.   The method of claim 37 where the
alphanumeric page is sent with a predetermined paging
protocol.

15

39.   The method of claim 38 where the
predetermined paging protocol is Telocator Alphanumeric
Paging Protocol (TAP).

20   40.   The method of claim 38 where the
predetermined paging protocol is Telocator Data Protocol
(TDP).

41.   A method of directory assistance where a
25   calling customer has been connected to a called party
over a connection initiated by a directory assistance
center, the calling customer connected to the called
party with a telephonic device capable of receiving and
storing pages, the method comprising:
30   upon termination of the connection by the
calling customer,
receiving an alphanumeric page from the
directory assistance center, said alphanumeric page
including the destination telephone number and name of a
35   party associated with the destination telephone number;
and
storing said alphanumeric page in the calling
customer telephonic device.

42.   The method of claim 41 further comprising:
retrieving the alphanumeric page stored in the
calling customer telephonic device; and
calling the called party using the information
contained within the retrieved page.

43.   The method of claim 41 where the
alphanumeric page is sent with a predetermined paging
protocol.

44.   The method of claim 43 where the
predetermined paging protocol is Telocator Alphanumeric
Paging Protocol (TAP).

45.   The method of claim 43 where the
predetermined paging protocol is Telocator Data Protocol
(TDP).

46.   The method of claim 41 where the calling
customer telephonic device is a mobile telephone.

48.   The method of claim 41 where the calling
customer telephonic device is a personal communications
service device.

47.   A method of directory assistance providing
a directory assistance service at a directory assistance
center, where the directory assistance service is a call
back service chosen by a caller in which the directory
assistance center attempts to contact a called party,
who is unavailable to the caller, the method comprising:
attempting to contact the called party who is
unavailable to the caller on a first telephonic
connection at a predetermined interval;
upon successfully contacting the called party,
connecting to the caller on a second telephonic
connection;
determining whether caller desires to speak with
the called party, and if so

connecting the caller on the second telephonic connection to the called party on the first telephonic connection to complete the call between the caller and the called party.

5

48.   The method of claim 47, the method further comprising, allowing the caller to determine the predetermined interval at which the directory assistance center will attempt to contact the called party who is

10   unavailable.

49.   The method of claim 47, where the caller can select the failed number of attempts and the predetermined interval in which the directory assistance

15   center will try to reconnect to the called party who is unavailable, the method further comprising,

attempting to contact the called party who is unavailable at the predetermined interval;

determining whether the called party is

20   unavailable, and if so recording a failed attempt; and

upon exceeding the number of failed attempts selected by the caller,

terminating the attempts to contact the called party who is unavailable at the predetermined interval,

25   and

informing the caller that the directory assistance center did not successfully contact the called party before exceeding the selected number of failed attempts.

30

50.   A method of providing personalized telephone directory assistance service at a directory assistance center, comprising:

maintaining a database of telephone numbers in

35   association with attribute values, the attribute values relating to attributes of telephone subscribers having the telephone numbers;

receiving a customer call from a calling customer;

identifying an originating telephone number of the customer call;

retrieving an attribute value associated with the originating telephone number from the database; and

allocating the customer call to a directory assistance operator based on the attribute value associated with the originating telephone number.

51. The method of claim 50 wherein the attribute value identifies a language spoken by the telephone subscriber, the method further comprising:

assigning the customer call to a directory assistance operator who is a speaker of the language.

52. The method of claim 50 wherein the attribute value identifies the telephone subscriber as a preferred customer, the method further comprising:

prioritizing the customer call in relation to other calls to the directory assistance center.

53. A method of providing personalized telephone directory assistance service at a directory assistance center, comprising:

maintaining a database of telephone numbers in association with attribute values, the attribute values relating to attributes of telephone subscribers having the telephone numbers;

receiving a customer call from a calling customer;

identifying an originating telephone number of the customer call;

retrieving an attribute value associated with the originating telephone number from the database; and

playing personalized automated audio according to the attribute value, the personalized automated audio being specific to the telephone subscriber whereby different personalized automated audio is played to at least some of the calls received at the directory assistance center.

54. The method of claim 53 wherein the personalized automated audio comprises greetings, and closings.

55. The method of claim 53 wherein the personalized automated audio comprises a menu having a set of options based on the attribute value, whereby a different menu is played to at least some of the calls received at the directory assistance center.

56. The method of claim 55 wherein the menu comprises a set of options for actions in response to a failure to connect with a desired party, the method further comprising:

locating a destination telephone number of the desired party wanted by the calling customer in a computer database;

initiating an attempt to telephonically connect the calling customer to the destination telephone number;

monitoring the attempt to detect a predetermined status signal indicative of failure to telephonically connect the calling customer to the destination telephone number;

if the predetermined status signal is detected, playing the menu to the calling customer;

monitoring the customer call for input from the calling customer responsive to the menu and indicative of one of the options; and

taking the action for the option indicated by the input.

METHOD AND SYSTEM FOR DIRECTORY ASSISTANCE SERVICES

Abstract of the Disclosure

A mobile telephone, or personal communication

5   services subscriber who wishes directory assistance
services is connected in the conventional manner to an
operator who identifies a destination telephone number
desired by the subscriber. As known in the prior art,
the operator then initiates a call connecting the

10   subscriber to the destination telephone number. In a
preferred embodiment, the operator locates a desired
destination telephone number in a computer database, and
can select automatic dialing of the located number.
Further, rather than dropping all further involvement

15   with the call, the preferred embodiment of the present
invention continually monitors the connection thereby
established for a predetermined DTMF signal issued by
the customer, such as that obtained by pressing the "*"
button. If such a signal is detected, the customer is

20   transferred to a directory assistance operator, who can
then provide whatever further assistance is needed
(e.g., providing further directory assistance). If a
busy signal or non-answering party is detected, a
customer is given a plurality of options including

25   leaving a recorded message or page, or a predetermined
alphanumeric message or page for the called party. In
this case, the system automatically tries, repeatedly,
to deliver the recorded message or page and, optionally,
confirms successful or failed message delivery to the

30   calling party.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Patrick M. Cox, *et al.*

Serial No.: 08/620,374   Group Art Unit: 2601

Filed: March 22, 1996   Examiner:

For: **METHOD AND SYSTEM FOR**   Client Docket No.:
       DIRECTORY ASSISTANCE   2621-43801/SAW
       SERVICES
                                           Pennie & Edmonds Docket No.:
                                           8897-003-999

CERTIFICATE UNDER 37 C.F.R. §3.73(b)
AND REVOCATION AND POWER OF ATTORNEY

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The undersigned has reviewed all the documents in the chain of title of the

above-identified patent application and, to the best of undersigned's knowledge and belief,

title is in the assignee identified above.

METRO ONE TELECOMMUNICATIONS, INC., having a principal place

of business located at 8405 S.W. Nimbus Avenue, Beaverton, Oregon 97005, certifies

that it is the assignee and owner of the entire right, title and interest in to and under the

invention described and claimed in the above-identified application by virtue of an

Assignment, a copy of which is attached hereto, hereby revokes all previous powers of

attorney and appoints S. Leslie Misrock (Reg. No. 18872), Harry C. Jones, III (Reg. No.

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Friebel (Reg. No. 29258), Laura A. Coruzzi (Reg. No. 30742), Jennifer Gordon (Reg.

No. 30753), Jon R. Stark (Reg. No. 30111), Allan A. Fanucci (Reg. No. 30256),

Geraldine F. Baldwin (Reg. No. 31232), Albert P. Halluin, (Reg. No. 25,227) and Victor

N. Balancia (Reg. No. 31231), whose address is Pennie & Edmonds, 1155 Avenue of the

Americas, New York, N.Y. 10036, and each of them its attorneys, to prosecute this

application, and to transact all business in the Patent and Trademark Office connected

therewith.

Please direct all correspondence to:

Albert P. Halluin
Pennie & Edmonds
1155 Avenue of the Americas
New York, N.Y. 10036

and direct all telephone calls and fascimile transmissions to Albert P. Halluin, Pennie &
Edmonds, telephone (415) 854-3660, fascimile (415) 854-3694.

The undersigned (whose title is supplied below) is empowered to act on

behalf of the assignee.

I hereby declare that all statements made herein of my own knowledge are true, and that these statements are made with the knowledge that willful false statements, and the like so made, are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of the United states Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

METRO ONE TELECOMMUNCIATIONS, INC.

Dated: 12·26·96   By: _____

Karen L. Johnson

Title: Vice President, Controller
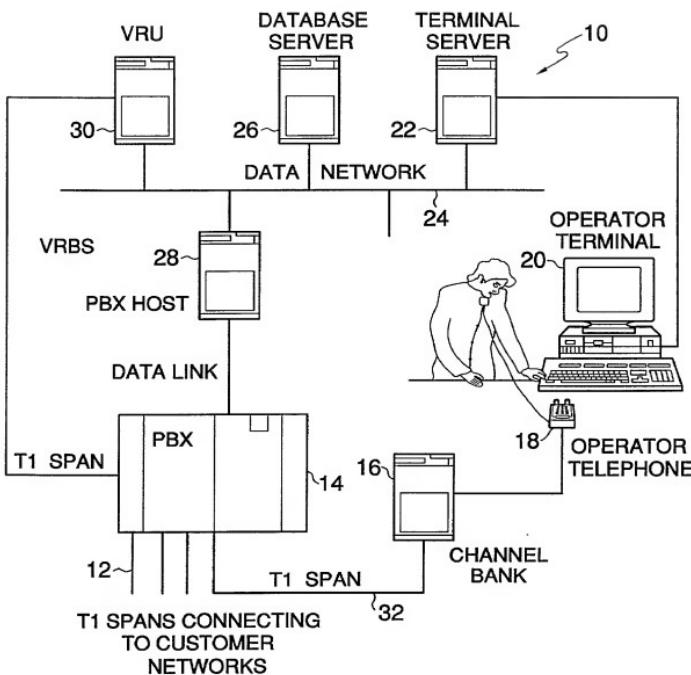
FIG. 1
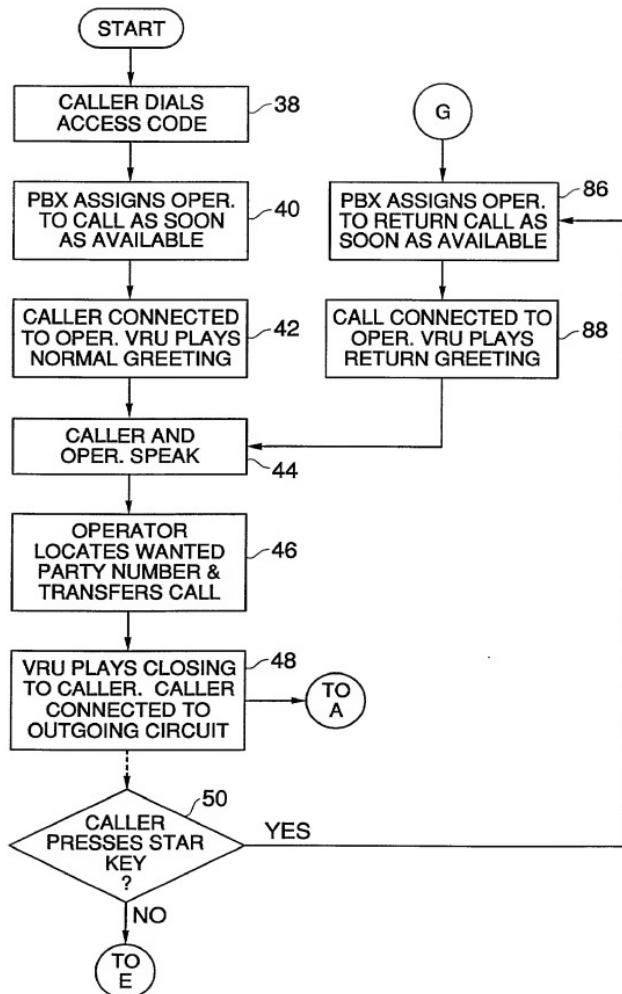
FIG. 2A
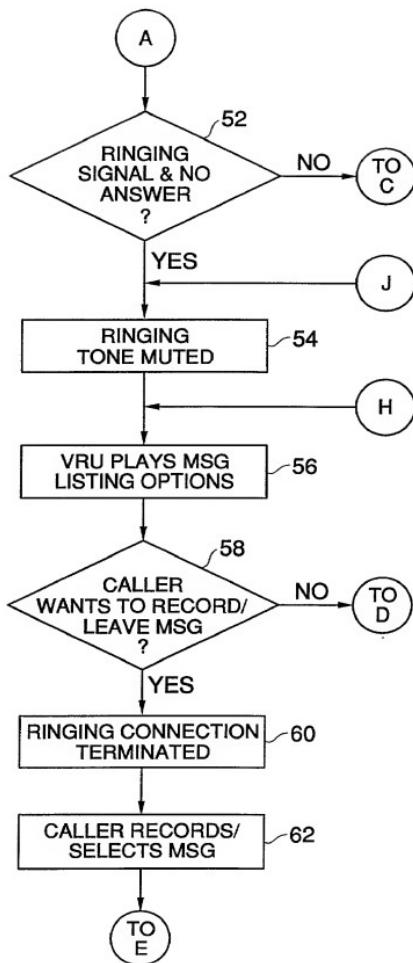
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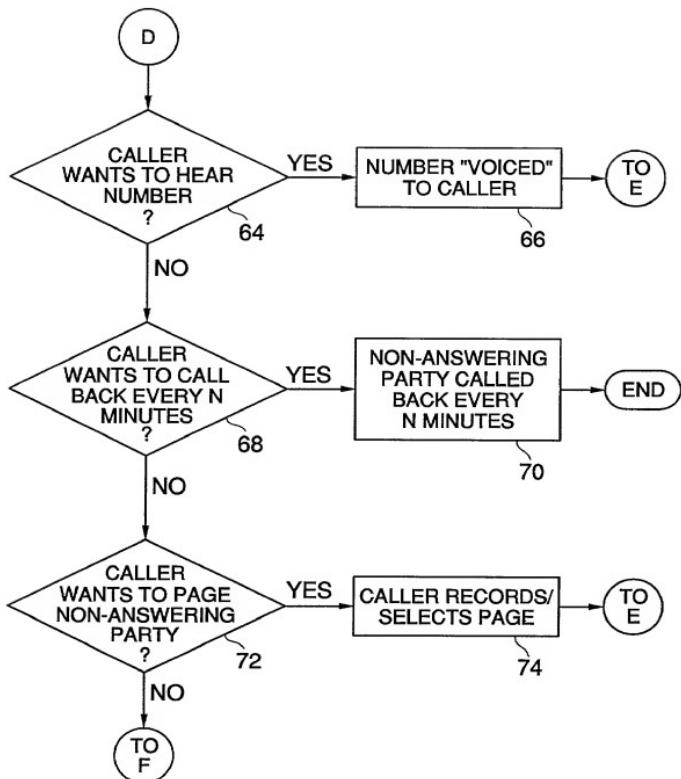
FIG. 2C
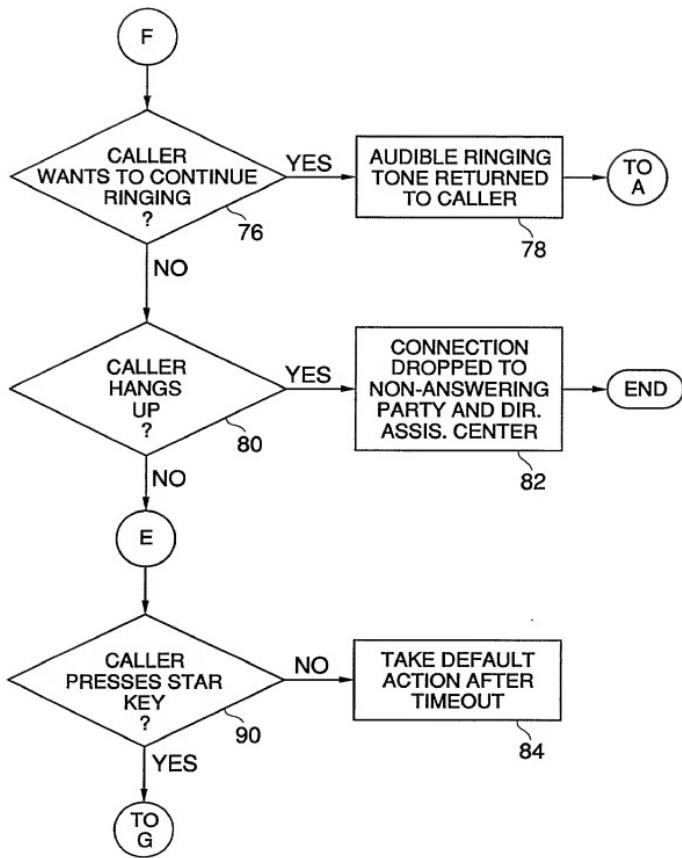
FIG. 2D
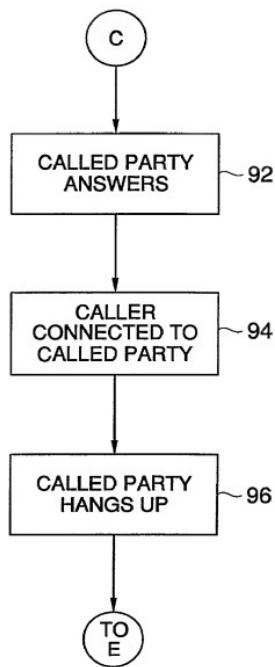
FIG. 2E
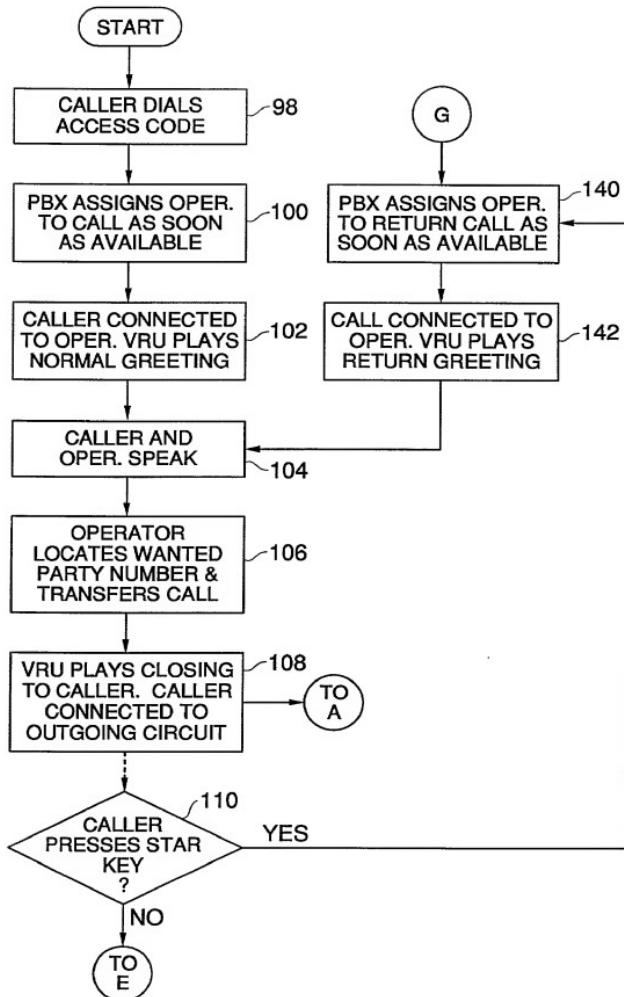
FIG. 3A
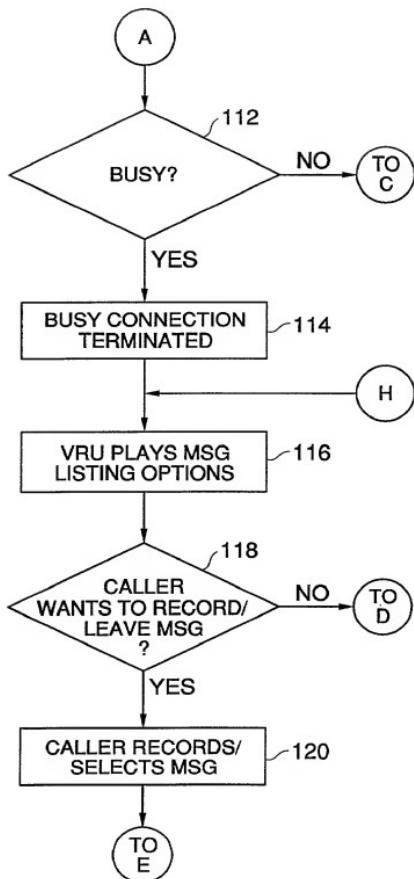
FIG. 3B
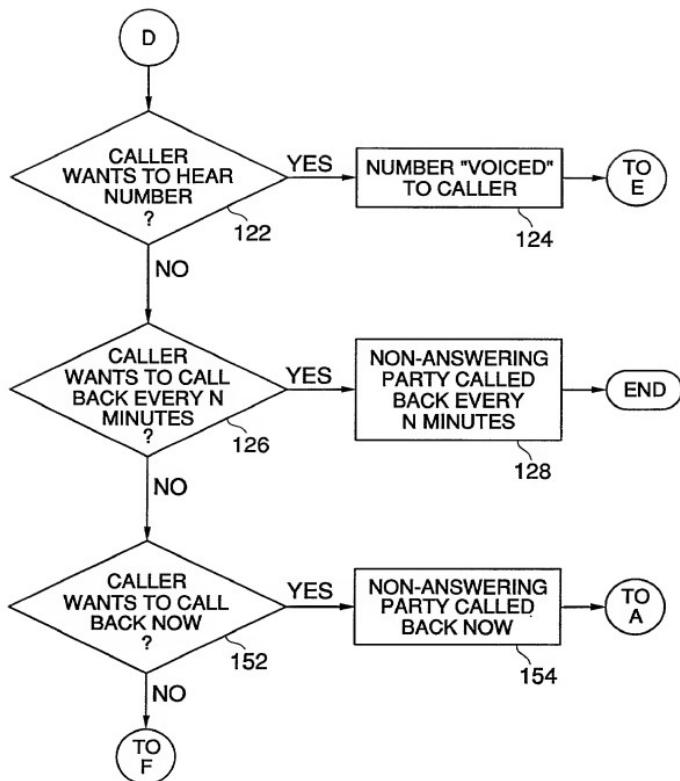
FIG. 3C
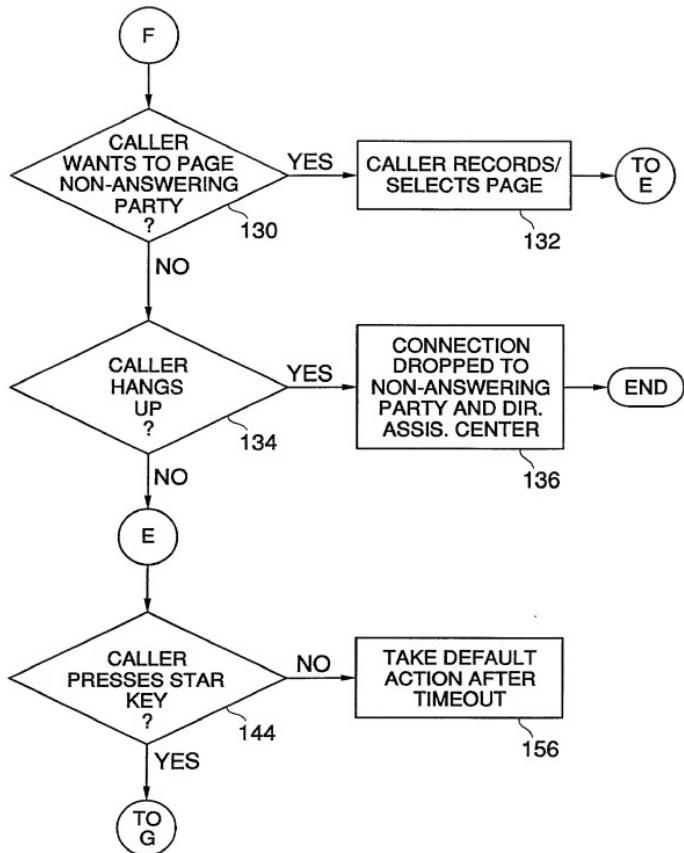
FIG. 3D
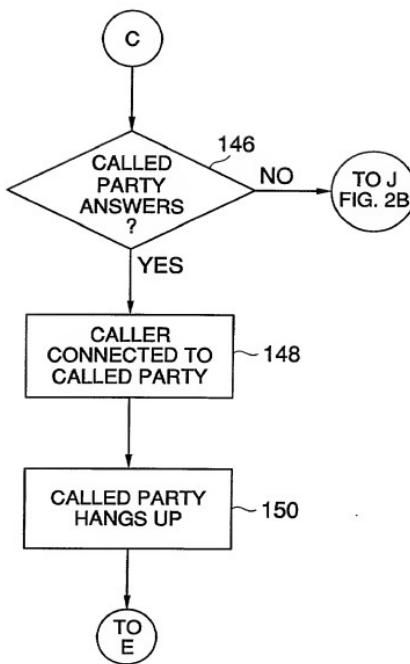
FIG. 3E

COMBINED DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled METHOD AND SYSTEM FOR DIRECTORY ASSISTANCE SERVICES, the specification of which

[ ] is attached hereto.

[x] was filed on March 22, 1996 as Application No. 08/620,374.

[ ] and was amended on _____ (if applicable).

[ ] with amendments through _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a). If this is a continuation-in-part application filed under the conditions specified in 35 U.S.C. §120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, I further acknowledge the duty to disclose material information as defined in 37 CFR §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

        Prior Foreign Application(s)   Priority
                                                            Claimed

_____   _____ _____   [ ]   [ ]
      (Number)   (Country)   (Day/Month/Year Filed)   Yes   No

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application No.)	(Filing Date)	(Status: patented, pending, abandoned)

The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from _____ as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application, to file a corresponding international application, and to transact all business in the Patent and Trademark Office connected therewith:

Name	Reg. No.	Name	Reg. No.
Kenneth S. Klarquist	16,445	Donald L. Stephens Jr.	34,022
James Campbell	19,978	Stacey C. Slater	36,011
James S. Leigh	20,434	Douglas D. Hancock	35,889
Arthur L. Whinston	19,155	Garth A. Winn	33,220
David P. Petersen	28,106	Stephen A. Wight	37,759
Richard J. Polley	28,107	Joel R. Meyer	37,677
Ramon A. Klitzke II	30,188	Joseph T. Jakubek	34,190
William Y. Conwell	31,943	Mark A. Porter	35,327
Mark L. Becker	31,325	Alan E. Dow	35,123
William D. Noonan	30,878	Mark M. Meininger	32,428
John D. Vandenberg	31,312	Robert F. Scotti	39,830
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Address all correspondence to:

> KLARQUIST SPARKMAN CAMPBELL
>   LEIGH & WHINSTON, LLP
> One World Trade Center, Suite 1600
> 121 S.W. Salmon Street
> Portland, Oregon 97204

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first joint inventor: Patrick M. Cox
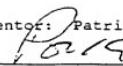
Inventor's signature _____

Residence: 6700 Juniper Terrace, Beaverton, Oregon 97005

Citizenship: United States of America

Post Office address: Same as above

5 July 96
Date

Full name of second joint inventor, if any: Adrian P. Powell
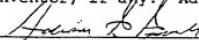
Inventor's signature _____

Residence: 28966 Girard Road, Colton, Oregon 97017

Citizenship: Great Britain

Post Office address: Same as above

June 6, 1996
Date

Full name of third joint inventor: Paul W. Filliger
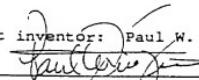
Inventor's signature _____

Residence: 208 Mill Street, Silverton, Oregon 97381

Citizenship: United States of America

Post Office address: Same as above

June 6, 1996
Date

Full name of fourth joint inventor, if any: Michael A. Kepler
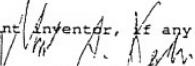
Inventor's signature _____

Residence: 5850 SW 177th Avenue, Aloha, Oregon 97007

Citizenship: United States of America

Post Office address: Same as above

_6/6/96_
Date

Full name of fifth joint inventor, if any: Timothy A. Timmons
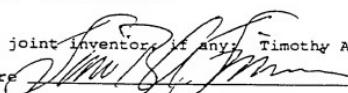
Inventor's signature _____

Residence: 14355 SW McFarland Boulevard, Tigard, Oregon 97224

Citizenship: United States of America

Post Office address: Same as above

_6/12/96_
Date